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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/652,493
Filing Date: September 02, 2003
Appellant(s): CHOE ET AL.

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Randall S. Svihla
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/19/07 appealing from the Office action mailed
10/12/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct. But, upon further consideration, claim 28 is objected to as being dependent upon a rejected base claim and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2,799,764	Chandler	7-1957
3,842,241	Isaacson et al	10-1974
6,242,719	Kano et al	6-2001
6,162,300	Bichrt	12-2000
4,804,823	Okuda et al	2-1989
4,217,855	Takagi	8-1980
6,024,799	Chen et al	2-2000
5,728,223	Murakami et al	03-1998
6,242,719	Kano	6-2001
6,030,458	Colombo et al	2-2000
5,034,200	Yamashita et al	7-1991
4,511,612	Huther et al	4-1985

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

- i) Claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow (US 5,157,240) in view of Chandler (US 2,799,764) or Isaacson et al (US 3,842,241).

Chow shows a heating crucible having a main body container, a cover formed of an insulating material such as the nitride ceramic with a nozzle, one or more heating elements as a cover heater formed as a thin film deposited or sprayed via chemical vapor deposition process on a top surface of the cover wherein one heating element would form a single layer heater, a body

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heater for heating the main body, the cover heater having a wire pattern formed over the entire top surface of the cover with the positive and negative thermals, a thermocouple in the cover, a heat-resistant layer (25') on the cover heater, the main body also formed of an insulating material such as the nitride ceramic with a body heater as a thin film on the outer wall of the main body, a heat resistant layer (25) on the body heater, the body heater having a single wire pattern with the positive and negative terminals, and a thermocouple inside the main body. However, Chow does not show a heat reflective layer between the heater and the heat-resistant layer.

Chandler or Isaacson shows that it is well known in the art to provide a heating device having a heating element provided with a heat reflective layer to direct the heat toward the desired heating surface. In Chandler, it is shown that the heating element (72) is provided on a heating surface (76) with a heat reflecting layer (62) disposed between the heating element and a heat resistant/insulating layer (78). Isaacson also shows a heating surface (14) upon which a heating element (50) provided thereto with a heat reflective layer (56) disposed between the heating element and a heat resistant layer (40).

In view of Chandler or Isaacson, it would have been obvious to one of ordinary skill in the art to adapt Chow with a reflective layer provided between the heat resistant layer and the heater to reflect the heat generated by the heater toward an intended heating direction.

With respect to claim 9, Chow shows the cover having a nozzle in the center of the cover with a cover heater provided around the nozzle. However, while, Chow does not show that the cover heater concentric pattern around the nozzle, it would have been obvious to one of ordinary skill in the art to provide the cover heater in the concentric pattern or any other pattern to effectively provide uniform and stable heating across the cover.

With respect to the sprayed method by which the heating element or block is provided on the cover, claim 16 is construed as a product by process claim. And since the patentability depends on the structure and not by the process, the structure of claim 16 is deemed met by Chow. Furthermore, Chow also shows that the heat emitting material or the heating material is deposited by the chemical vapor deposition which is the method by which the recited heat emitting material is also provided (see page 7, lines 1-4 of the applicant's specification)

ii) Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 above, and further in view of Kano et al (US 6,242,719).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater being platinum.

Kano shows a heating element such as platinum or graphite deposited or printed via the chemical vapor deposition on an insulating ceramic layer such as pyrolytic boron nitride or aluminum nitride. In view of Kano, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of platinum as an alternative conductive material that can alternatively provide stable and uniform heating temperature, and with respect to claim 14, it would have been obvious to further provide insulating material made of aluminum nitride that alternatively provide a good electrical and thermally conductive material.

iii) Claims 8, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 above, and further in view Bichrt (US 6,162,300).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover or the main body is made of alumina or silicon carbide

Bichrt shows a ceramic body made of alumina or silicon carbide as well as pyrolytic boron nitride. In view of Bichrt, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover and the main body made of alumina or silicon carbide in place of the pyrolytic boron nitride since such is well known in the art to alternatively provide a mechanically and thermally stable body that can withstand a temperature, pressure and chemical stress.

iv) Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Okuda et al (US 4,804,823).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater is made of conductive paste with metal particles and metal oxides.

Okuda show that it is known in the art to provide a conductive paste made with metal particles or metal oxides applied to a ceramic substrate to form a sintered electrical heater. In view of Okuda, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of conductive paste having the metal particles and metal oxides to form a heating element that can provide a mechanically and thermally stable heater that can also withstand a high temperature.

v) Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Takagi (US 4,217,855).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except on the entire outer bottom wall of the main body.

Takagi shows a heating crucible having a main body wherein the heating element is provided along the entire body including the bottom wall of the crucible (see Figure 8).

In view of Takagi, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the crucible having the bottom wall with the heating element formed on the entire surface as an alternative form to efficiently and adequately heat the content of the crucible.

vi) Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 above, and further in view Chen et al (US 6,024,799) or Murakami et al (US 5,728,223).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the nozzle having a convergent-divergent nozzle.

Chen and Murakami show that it is well known in the art to provide the gaseous outlet nozzle with a convergent-divergent nozzle that is flush with the gas outlet surface cover. In view of Chen or Murakami, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the nozzle having a convergent-divergent nozzle to provide a more defined outlet gas flow for even distribution of the vapor deposition.

Note: The Colombo, Yamashita and Huther references are not applied in the ground of rejection, but they are listed under the section (8) Evidence Relied upon above in response to the applicant's newly raised argument in the brief that the pyrolytic boron nitride material shown in

Chow is not a heat-resistant material. Contrary to the applicant's argument, these references show that the pyrolytic boron nitride materials are heat-resistant material.

(10) Response to Argument

The applicant argues Chow, Chandler, and Isaacson do not disclose or teach the recited "heat-resistant layer formed on a surface of the cover heater." The applicant argues that the layer (25, 25') shown in Chow is not a "heat-resistant layer" but is rather a protective layer that shows nothing whatsoever as the "heat-resistant layer." The applicant's argument is not deemed persuasive. The term "heat-resistant" is such a broad terminology. The examiner has raised the broadness of such term in the non final office action mailed on 5/2/06 as well as in the final office action 10/12/06 and discussed that a "heat-resistant layer" can be broadly interpreted as any layer that "impedes a heat transfer." Furthermore, the examiner's interpretation of the "heat-resistant material" is also based on the applicant's own disclosure wherein it states that the "heat-resistant layer" is a thin film type (see page 7, paragraph 35). It is noted that the applicant has not disclosed any other structure or material in relation to the heat-resistant material. Thus, interpreting the claims and its scope in light of the applicant's specification, the examiner has interpreted the Chow layer (25, 25'), which is a thin layer type made of pyrolytic boron nitride, as the recited "heat-resistant layer". The examiner's interpretation of the "heat-resistant material" as the layer that impedes a heat transfer is also deemed reasonable in light of the applicant's newly submitted English translation of Korean priority document 2002-52898 which refers the "heat-resistant layer" as an "adiabatic layer" that "block transmission of heat."

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The applicant argues that such interpretation is unreasonable because it ignores the limitation of “heat-resistant” in the “heat-resistant layer.” The applicant seems to suggest that since Chow calls the layer as “protective layer”, it can only serve or function as a protective layer and no other purpose. However, it is noted that there is a well established controlling authority that when the structure or material recited in the prior art is substantially identical to that of the claims, the claimed properties or functions are assumed to be inherent. In this case, the recited structural limitation of the “heat-resistant layer” is a layer which is disclosed as a thin film type, and Chow which clearly shows such recited structural limitation, the recited “heat-resistant” property is deemed inherent.

The applicant further raises a new argument that it is known in the art that the protective layer of Chow which made of pyrolytic boron nitride is a material of a very high thermal conductivity and, as such, the pyrolytic boron nitride transmits heat rather than blocks it. However, contrary to the applicant’s argument, it is known in the art that the pyrolytic boron nitride material is a high temperature/heat resistant material as shown in US Patent Nos. 5,034,200 (see column 7, lines 9-14), 6,030,458 (see column 2, lines 15-18), and 4,511,612 (see column 3, lines 13-25). Thus, the applicant’s argument is not deemed persuasive.

With respect to Chandler, the applicant argues that the layer (78) in Chandler is made of “paper, paperboard, cloth, or other suitable material”, and such material is not a heat-resistant but nothing more than backing layer as Chandler intended to apply. As in the final office action, the examiner has raised the issue that it is notoriously known that paper and cloth can be a heat-resistant material as it is experienced in daily livelihood where a paper towel or cloth is used as a

heat-resistant material to hold and removed a hot pan off a stove. This example is shown to provided that materials such as paper and cloth can be a heat-resistant material/layer.

It is noted, however, that Chandler is applied to teach the recited reflective layer and not a heat resistant layer, and Chandler clearly shows the reflective layer as the element (62) that is disposed between a heating element and a heat resistant layer 78. Isaacson is also alternatively applied to show the reflective layer. The applicant argues that the layer (40) of Isaacson is a holder and not a heat-resistant layer, and further argues that the examiner has based the rejection on a hindsight reconstruction. This argument is not deemed persuasive since there is no reason why this layer (40) cannot be used as a heat-resistant layer, and there is no claimed structure or support to distinguish the claimed invention from that of the applied prior art.

With respect to claims 2 and 18, the applicant argues Chow shows the cover heater having two wires and the body heater also having two wires, and this showing, the applicant argues, does not teach single wire formed on the entire surface of the cover heater and the body heater. It is noted that the recited one single wire in the cover heater and the body heater is clearly met by one of the two wires in each of the respective cover and the body heater. , i.e., two wires in Chow shows the recited single wire. Furthermore, Chow teaches that the cover can have one or more heating elements (column 2, lines 26-29), and this teaching would also be applicable to the body heater as Chow describes the heating arrangement with respect to the cover is also applicable to the body heater (see column 5, lines 49-53).

Despite this teaching in Chow, the applicant states that Chow which “alludes” to one heating element is “an error” since Chow does not actually disclose or suggest the feature. The examiner would not speculate whether or not Chow is in error when Chow clearly teaches such

heating arrangement as described in column 2, lines 26-29. The applicant also states "assuming arguendo that the apparent allusion of Chow... is not an error, [and]the mere reference to one or more heating element does not provide an enabling disclosure for a cover having one heating element." This argument is deemed not persuasive. Chow teaches one heating element, and it clearly meets the recited single wire pattern.

With respect to claims 7 and 25, the applicant argues that the insulating material made of pyrolytic boron nitride in Chow is not a "good heat radiation property," and that the examiner has failed to provided the basis to support the theory of inherency. The applicant further argues there are different insulating materials having different radiation property, and no theory of inherency can be met when there is no basis in fact or technical reasoning. The applicant argue that the insulating material is disclosed as alumina, and this is not shown or taught by Chow. The applicant's argument is not deemed persuasive. It is noted that alumina as the insulating material has not been claimed, and all that is claimed by the applicant is an insulating material with no other structural support or material which does not distinguish the claimed insulating material from that of Chow in any form or shape. As discussed previously, when the structure or material recited in the reference is substantially identical as that of the claims, the claimed properties or functions are assumed inherent. All that is recited in the claims with respect to the material is that it is an insulating material with no other structure or composition. In such a broad claim, the prior art having the material made of an insulating material also meets the recited properties or functions.

With respect to claim 9, the applicant argues that the examiner has relied on the applicant's own disclosure to meet the recited cover heater formed in a "concentric pattern

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around the nozzle.” This argument is not deemed persuasive. Chow teaches that its crucible can have different shapes (also see Figures 2 and 7), but more importantly Chow teaches that having an uniform heating distribution is desired when operating this device (see column 1, lines 64-67). It was pointed previously to the applicant that a concentric pattern is not a critical element and other shapes can be provided to achieve such desired uniformity. The applicant also disclose in its specification that many other shape can be had (page 6, paragraph 31). Thus, having such concentric pattern or any other shapes would have been within the level of ordinary skill in the art to provide uniform and stable heating across the cover.

With respect to claim 16, the applicant argues the claim as amended is not a product by process and further argues that while the heating elements of Chow is achieved via the chemical vapor deposition, the recited heating bock is rather achieved or constituted by the sprayed heat emitting material pattern. The examiner has construed the amended claim 16 as a product by process since the structure is defined by the process of “sprayed” by which he heat emitting material is provided thereto. And even if the claim is not deemed as a product by process, it is also noted that the chemical vapor deposition is the same method by which the heat emitting material is made (see page 7, lines 1-4 of the applicant’s specification). Thus, the applicant’s argument is not deemed persuasive.

Regarding the recited single-layer cover or body heater, the applicant argues Chow shows a three layer cover heater which includes a first and a second heating element with an insulating layer. This argument is not deemed persuasive. Chow clearly teaches that only one heating element can be used, as shown in column 2, lines 27-30, and this teaching clearly meets the recited single layer cover heater and the single layer body heater.

With respect to Okuda regarding the recited metal particles and metal oxide, the applicant argues that the metal nitride or carbide particles of Okuda do not meet the recited “metal particles”. The applicant further states while Okuda shows the conductive pastes comprising metal nitrides/carbide particles with metal oxide, such composition does not meet the recited “metal particles and metal oxides.” The applicant argues it is unreasonable to interpret the metal carbide/nitride particles which includes nonmetal carbon or nitrogen can be “metal particles”. This argument is not deemed persuasive. The recited conductive paste comprising the metal particles and metal oxide clearly read on the composition of Okuda which includes the particles including metals, nonmetal and metal oxides, i.e., the recited composition is a subset of the Okuda composition. It is furthermore noted that the use of the open ended transitional phrase “comprising” allows the recited metal particles to include not only metals but also un-recited elements including nonmetal as well. This is not an unreasonable interpretation of the claim.

With respect to the recited “convergent-divergent nozzle”, the applicant argues Chow does not show such nozzle. Figure 7 of Chow clearly shows a nozzle with a smaller opening lead to a large opening constitutes the convergent-divergent nozzle, i.e., the nozzle 19' of Chow which widens into a larger opening allows a divergent pattern. The Chen and Murakami references are also shown that such convergent-divergent nozzle is well known in the art.

Claim 28, upon further consideration, is deemed allowable over Chow in view of Chen or Murakami, and the applicant’s arguments are moot.

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(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Sang Paik

Conferees:


Phil Leung
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